

DETAILED ACTION

1. Applicant's pre-appeal brief conference request, filed June 4, 2009, has been received and entered in full. In the 'Pre-Appeal Brief conference decision', filed August 21, 2009 it has been decided that prosecution for this case will be re-opened and thus, the finality of the rejection of the last Office action, mailed February 4, 2009 has been withdrawn.

2. Applicant's amendment of claims 1 and 2, withdrawal of claims 8-11 and cancellation of claim 14, filed March 24, 2009, have been received and entered in full.

3. Claims 1-7, 12 and 13 are under examination.

Claim Rejections - 35 USC § 112, second paragraph

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-7, 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite a method for creating a new flower color but it is unclear how the cited method steps would create a new flower color. It is unclear how the introduction of the genotype in the flavonoid biosynthesis would create a new flower color nor is it clear what colors are associated with the genotype.

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Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-7, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oud et al (Euphytica 84: 175-181, 1995), in view of Uddin et al (Acta Horticulturae. 2003. A Proceeding of the XXVI International Horticultural Congress, Elegant Science in Floriculture, pp.51-59, convention held 11-17 August 2002), in view of van Raamsdonk (Genetic Resources and Crop Evolution 40: 49-54, 1993).

The claims read on a method for creating a new flower color comprising:

(a) establishing or analyzing a genotype $H^xH^x \cdot Pg/pg \cdot Cy/cy \cdot Dp/dp$ in a flavonoid biosynthesis for crossing flowering plant;

(b) selecting two flowering plant to be crossed based on the established or analyzed genotype; and

(c) introducing the genotype in the flavonoid biosynthesis to create the new flower color, wherein the genotype $H^X H^X \cdot Pg/pg \cdot Cy/cy \cdot Dp/dp$ is an inheritance of flower pigments, pelargonidin (Pgn), cyanidin (Cyn), and delphinidin (Dpn), and wherein five multiple alleles H^T , H^F , H^D , H^Z , and H^O control hydroxylation at 3'-position, hydroxylation at 5'-position, hydroxylation of 3',5'-positions, hydroxylation at 3'- and 5'-positions, and hydroxylation of 5'-, and 3',5'-position, respectively.

Regarding claims 1 and 2, Oud et al teach (a) establishing or analyzing a genotype $H^X H^X \cdot Pg/pg \cdot Cy/cy \cdot Dp/dp$ in a flavonoid biosynthesis. See, for example, page 176, Figure 1 where it teaches the biosynthetic pathway of anthocyanins wherein said pathway comprises flower pigments pelargonidin, cyanidin and delphinidin as well as the hydroxylation allele H^F .

In addition, Uddin et al teach (b) selecting two flowering plant to be crossed based on the established or analyzed genotype. See, for example, page 51, last paragraph where Uddin et al teach "[r]eciprocal cross-pollination among the three major anthocyanidin predominant F1 cultivars were done and the F1 progenies were further self- and cross-pollinated to determine the segregation of anthocyanidin phenotypes.

Furthermore, Uddin et al teach (c) introducing the genotype in the flavonoid biosynthesis to create the new flower color. See, for example, page 53, 1st – 8th paragraph where Uddin et al teach genotypes $H^X H^X$, Pg/pg , Cy/cy , and Dp/dp produced from crossing flowering plants based on pigment genotypes and the segregation of

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genes to produce new genotypes, wherein four multiple alleles, H^T , H^F , H^D , and H^O control hydroxylation.

The specification teaches that genotypes D/d and E/e are associated with corolla characters of double flower type and marginal variegation, respectively (see, for example, page 3 of 'Claims' filed November 22, 2005).

Oud et al teach that in *Petunia hybrida* different flower types can be distinguished based on the gene *Un* which determines the 'undulata' shape of the corolla (see page 175, 1st column, 'Introduction'). Though Oud et al do not teach genotypes D/d and E/e associated with corolla, they do teach the gene *Un* associated with corolla and one of ordinary skill in the art would appreciate that other genes are associated with corolla.

Regarding claims 4-6, Oud et al teach flower color of flowering plants inherited in the course of flavonoid biosynthesis. See, for example, page 178, Table 3 where Oud et al teach color description and pigment analysis of F3 breeding lines and their corresponding F4 offspring as well as their relative anthocyanidin content and Figure 1 where it teaches flavonoid biosynthesis.

Regarding claims 7 and 12, Oud et al teach flower color is maternally inherited. See, for example, page 176, 2nd column, 'Materials and methods' where Oud et al teach recombinations using transgenic lines as male as well as female were made with the four selected elite lines.

Regarding claims 3 and 13, Oud et al do not teach the flavonoid biosynthesis route formula of claim 3 nor the H^Z allele; however, van Raamsdonk teaches the flavonoid biosynthesis route formula of claim 3. See, for example, page 50, Figure 1

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where it depicts the biosynthetic pathway of anthocyanidins. Though van Raamsdonk does not explicitly teach the H² allele, it is implicitly taught in Figure 1 because Figure 1 of the van Raamsdonk teaches hydroxylation at the 3'- and 5'-positions.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the above teachings to produce the claimed invention.

One of ordinary skill in the art would have been motivated to combine these teachings because van Raamsdonk teaches that the anthocyanidin pigments pelargonidin, cyanidin and delphinidin play a major role in flower coloration (see page 49, 'Introduction') and Oud et al teach that the use of different genetic backgrounds can produce new combinations of anthocyanidins yielding different color shades (see page 178, 1st column, lines 1-3).

In addition, one of ordinary skill in the art would have reasonable expectation of success based on the success of Oud et al in crossing flowering plants based on their pigment genotypes, as discussed above.

Conclusion

9. No claims are allowed.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH O. ROBINSON whose telephone number is

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(571)272-2918. The examiner can normally be reached Monday – Friday, 8:00 a.m. - 4:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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